

A careful study of the material is planned and may lead to different conclusions, but it seems quite certain that the fauna is very similar to that previously described from near Danville, Illinois, and to that of the Permo-Carboniferous beds of Texas and Oklahoma.

BOTANY.—*A new species of Calathea from Panamá.*¹ C. V. MORTON,
National Museum. (Communicated by WILLIAM R. MAXON).

The following species of *Calathea* was discovered by Dr. A. F. Skutch while engaged in research work at the experiment station of the United Fruit Company at Almirante, Panamá, and is based on ample material presented by him to the U. S. National Museum. The description is also drawn in part from field notes made by Doctor Skutch, who is planning to publish shortly an account of the morphology and method of unrolling of the leaves.

***Calathea magnifica* Morton & Skutch, sp. nov.**

Large herb reaching a height of 5 meters; radical leaves 2-ranked, homotropous; petioles reaching about 290 cm. in length, the lower half sheathing, the upper half terete, 1.3–1.6 cm. thick, the callous body at its upper end 23 cm. long; lamina with the right half always innermost in vernation, gradually increasing in size until the plant matures, oblong, truncate at apex, slightly asymmetric, the largest 114 cm. long by 58 cm. broad, glabrous, the lower surface whitish with a thick layer of wax, this separating in large flakes upon drying; stem 110–150 cm. long, bearing two leaves, the first one with the blade equaling that of the radical leaves, the second reduced; sheath 30–56 cm. long, not or scarcely auriculate, pubescent with short, simple hairs; inflorescence of two groups of spikes, one group from the axil of each of the cauline leaves; peduncles of spikes in the axils of lower leaf 30–60 cm. long, of upper leaf 10–50 cm. long, flattened, often flexuous, pubescent (especially at apex), streaked with pale green and brown; primary spikes 7–9, secondary spikes often arising from the lowermost bract of a primary, subcylindric, 18–30 cm. long, 3.5–5 cm. thick, the bracts 16–20 or more, distichous but somewhat displaced by a spiral twist of the axis, thus forming two spiral series, leathery-chartaceous, broadly obovate, 5–6 cm. long, 5.5–7 cm. broad, pale green streaked or washed with brown, sparsely pubescent outside, glabrous within; primary bractlets winged on the back, hispid along the wing; flowers in pairs, the two usually not developing simultaneously, 4.6 cm. long; sepals lanceolate, 9–10 mm. long; corolla tube 2.6 cm. long, lobes oblong, obtuse, 20 mm. long, 7 mm. broad, dark Corinthian purple; staminodium white, obovate, 1.5 cm. long, ovary naked, surrounded by a tuft of hairs arising from its base; capsule loculicidal, 1.7 cm. long, pink; seed 7 mm. long; aril lamellose, 5 mm. long.

Type in the U. S. National Herbarium, no. 1,409,622–3, collected at the research station of the United Fruit Company, Almirante, Panamá, April 20, 1929, by A. F. Skutch (no. 12).

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Fig. 1. *Calathea magnifica* Morton and Skutch. Inflorescence and leaf.



Fig. 2. Same, habitat view.

Dr. Skutch's field notes state that *Calathea magnifica* is the most abundant and conspicuous *Calathea* in the lowlands of the province of Bocas del Toro. It forms close stands in marshy places and at the borders of lagoons, and sometimes also in fairly well drained pasture land, but always in open places rather than dense jungles. It was in flower from January to June at least, but at the latter date the spikes were very old. At maturity the pedicel disintegrates, freeing the capsule, which then oozes through the plentiful slime coating the bracts and bractlets until it is exposed at the top, when it is burst by the swelling of the aril. The seeds are sought by birds.

It is surprising that such a large and beautiful species as *Calathea magnifica* could have remained so long undiscovered. Its closest alliance is with *C. lutea* (Aubl.) G. F. W. Meyer. This common Central American plant, which is usually smaller, has smaller spikes with fewer, bronze or reddish colored bracts, and yellow corollas. Related also is *C. insignis* Peters, a species smaller in all parts, having non-ceraceous leaves, glabrous, more widely spreading, closely imbricated bracts, and yellowish or whitish corollas.

In Fig. 1 the scale is indicated by the ruler, which is 30 cm. long.

BOTANY.—*Ten new species of Passiflora, mainly from Colombia and Peru.*¹ ELLSWORTH P. KILLIP, U. S. National Museum.

In the present paper ten new species of *Passiflora* are described, four of which are based upon material collected in the course of botanical exploration in Colombia and Peru recently carried on by the Smithsonian Institution.

Passiflora dolichocarpa Killip, sp. nov.

Stem subquadrangular, hispidulous; stipules semi-ovate, 6 to 7 mm. long, 2 to 3 mm. wide, finely hispidulous, especially at margin; petioles about 2 cm. long, slender, biglandular at or slightly below middle, the glands clavate, about 1.5 mm. long, 1 mm. wide, sessile; leaves hastately 3-lobed, 6 to 10 cm. long, 4.5 to 7 cm. wide (middle lobe lanceolate, acuminate, 3.5 to 4 cm. wide at base, the basal lobes reduced, short-acuminate), sinuate-dentate at margin, cordulate at base, membranous, finely hispidulous on both surfaces; peduncles in pairs, 3.5 to 4 cm. long, slender, articulate near apex; bracts semi-ovate, 4 to 5 mm. long, 3 to 4 mm. wide, oblique at base, sessile, irregularly lobed, hispidulous, borne at upper third of peduncle; flowers about 2.5 cm. wide; sepals oblong, 10 to 13 mm. long, 7 to 8 mm. wide, slightly cucullate at apex, hispidulous without, white, longitudinally streaked with red or purple within; petals oblong, 8 to 10 mm. long, 3 to 4 mm. wide, obtuse, white; corona filaments in a single series, narrowly linear, 6 to 7 mm. long, white, banded with red or purple; operculum plicate, about 1.5 mm. high, the margin incurved, minutely denticulate; limen annular; ovary ovoid, tapering at apex, stipitate at base, glabrous; fruit narrowly ovoid-clavate, about 6 cm. long (including stipe 1.5 cm. long), 1.5 cm. in diameter; seeds broadly obovate, 3 to 4 mm. long, reticulate, flattened.

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Type in U. S. National Herbarium, no. 1,315,639, collected at Chicavac, Department Tecpán, Guatemala, altitude 2500 meters, December 25, 1926, by G. Salas (no. 584).

Although obviously related to *P. sicyoides* this species bears conspicuous bracts, shaped much like the stipules, and cleft somewhat as in *P. adenopoda*. The leaves are distinctly hastate, proportionately much narrower than in the case of other species of this relationship. The fruit is unusually long and narrow for the group.

The common name is given as "granadilla."

***Passiflora tenella* Killip, sp. nov.**

Slender herbaceous vine, essentially glabrous throughout; stem subangular, striate; stipules setaceous, 1.5 mm. long; petioles very slender, 1 to 2.5 cm. long, glandless, sparingly pilosulous toward apex; leaves transversely oblong in general outline, 1.5 to 3 cm. long, 4 to 7 cm. wide, shallowly 3-lobed at the truncate apex (lobes obtuse or truncate; rarely the leaves distinctly 3-lobed about a third their length), retuse at base, 3-nerved, not ocellate beneath, bright green above, glaucous beneath, thin-membranous; peduncles solitary, 1-flowered, very slender, 2 to 3 cm. long, articulate just below apex; bracts setaceous, 2 mm. long, soon deciduous; flowers about 1.5 cm. wide, greenish white; sepals narrowly lanceolate, 8 to 9 mm. long, 1.5 to 2 mm. wide at base, acutish, 3-nerved, reticulate-veined, thin-transparent; petals linear, 2 to 3 mm. long, obtuse, thin-transparent; corona filiform, in two series, the outer filaments equaling the sepals, the inner barely 2 mm. long; operculum membranous, about 1 mm. high, very slightly plicate; ovary narrowly ellipsoidal, glabrous; fruit ellipsoidal, about 3 cm. long, 0.8 cm. in diameter, tapering to a stipitate base, acuminate at apex, 6-ribbed; seeds narrowly obovate, about 2.5 mm. long, 1.5 mm. wide, transversely 4- or 5-sulcate, the ridges rugulose.

Type in the herbarium of the Field Museum of Natural History, no. 571,848, collected on plain southeast of Hacienda La Choza, Department Tumbes, Peru, altitude 100 to 200 meters, February 28 to March 3, 1927, by A. Weberbauer (no. 7704). Duplicate in U. S. National Herbarium (no. 1,420,160). Additional specimens examined:

PERU: Lima Botanic Garden, said to have come from forests of eastern Peru, *Pennell* 14801 (Herb. Philadelphia Acad. Nat. Sci.).

This interesting species probably belongs to the subgenus *Plectostemma*, although the small operculum, scarcely plicate, and the angular, capsule-like fruit suggest rather a relationship with *P. tryphostemmatoides* and *P. gracilima*, of Harms' group *Tryphosiemmatoides*. The flowers, as well as the fruits, resemble those of *P. gracilis*, a wholly different species without petals and with reticulate seeds and glandular petioles. The leaves are shaped much like those of *P. punctata*, another Peruvian species, but the far more delicate flowers, with filiform corona filaments and a glabrous ovary, clearly separate it.

***Passiflora dawei* Killip, sp. nov.**

Stem triangular, striate, minutely puberulous, at length glabrate; stipules narrowly linear-falcate, 9 to 10 mm. long, 1 mm. wide; petioles 3.5 to 4 cm.

long, glandless; leaves broadly ovate-oblong in general outline, 8 to 10 cm. along midnerve, 10 to 14 cm. along lateral nerves, 8 to 10 cm. wide at middle, 6 to 7 cm. wide between the tips of the lobes, 2-lobed about a third their length (lobes lanceolate, acute, the sinus deeply sinuate, mucronulate at base), rounded or subtruncate at base, 3-nerved, ocellate beneath, subcoriaceous, essentially glabrous, bright green (when dry) on both surfaces; peduncles 5 to 7 cm. long, articulate about 1 cm. below apex; bracts narrowly linear, 5 to 6 mm. long, 0.5 to 1 mm. wide; flowers (not fully developed) 3.5 to 4 cm. wide; sepals oblong-lanceolate, 1.5 to 2 cm. long, about 0.8 cm. wide, obtuse; petals similar to and slightly shorter than the sepals; corona filaments in two series, the outer trigonous, conspicuously dilated at and above middle, dark purple, the inner filiform, half as long, minutely capitellate; operculum closely plicate; limen annular; ovary globose, densely white pilose.

Type in the U. S. National Herbarium, no. 1,422,886, collected in the Department of Cundinamarca, Colombia, in February, 1916, by M. T. Dawe (no. 57).

This species is distinguished from *P. chelidonea* by proportionately broader leaves, longer peduncles, larger bracts, and by the shape of the outer corona filaments. It might be confused with *P. alnifolia*, a species common in the Central Cordillera of Colombia, but that has quite differently shaped outer corona filaments, shorter peduncles, and smaller leaves.

Passiflora bucaramangensis Killip, sp. nov.

Slender herbaceous vine, essentially glabrous throughout; stems slightly trigonous, striate, minutely scabrid; stipules narrowly linear-falcate or almost setaceous, 1 to 2 mm. long, reddish purple; petioles slender, 1 to 2.5 cm. long, glandless; leaves transversely oblong, 1 to 3 cm. long, 3 to 7 cm. wide, 3-lobed about a third their length (lobes subequal or the middle lobes slightly the longest, 1 to 2 cm. wide, obtuse or truncate, sometimes emarginate at apex), truncate or cordate at base, 3-nerved (nerves and veins usually prominent beneath), ocellate beneath, subcoriaceous, drying green; peduncles in pairs, about 1.5 cm. long, very slender; bracts setaceous, about 1 mm. long, scattered, persistent; flowers about 2 cm. wide; sepals linear-oblong, about 10 mm. long, 3 mm. wide, obtuse, grass-green, pale at margin; petals oblong, 5 to 6 mm. long, 3 mm. wide, obtuse, white; corona filaments in two series, the outer filaments narrowly linear-clavate, 4 to 5 mm. long, deep purple below, green at the slightly enlarged tip, the inner filaments filiform, 2 to 3 mm. long, grass-green; operculum closely plicate, denticulate at margin, deep purple; limen annular, green; ovary globose; fruit globose, 8 to 9 mm. in diameter; seeds obcordate, 3 mm. long, 2.5 mm. wide, transversely 5-sulcate, the ridges rugulose.

Type in the U. S. National Herbarium, no. 1,352,481, collected near La Baja, north of Bucaramanga, Department Santander, Colombia, altitude 2,400 meters, January 8, 1927, by E. P. Killip and Albert C. Smith (no. 16787).

Additional specimens examined:

COLOMBIA: Santander: Mesa de los Santos, 1,500 meters, *Killip & Smith* 15364 (N). California, 2,200 meters, *Killip & Smith* 17046 (G, N, Y), 18842 (G, N, Y). Tona, 2,000 meters, *Killip & Smith* 19508 (G, N).

This is distinguished from *P. erythrophylla* by equally 3-lobed leaves, the more slender and longer inner filaments of the corona, and by the relative length of the sepals to the petals.

***Passiflora popayanensis* Killip, sp. nov.**

Stem angular, compressed, tortuous, glabrous; stipules linear-setaceous, about 2 mm. long; petioles up to 1.5 cm. long, minutely pilosulous, glandless; leaves oblong or ovate-oblong, 5 to 7 cm. long, 3 to 3.5 cm. wide, bilobed (lobes lanceolate, 2 to 2.5 cm. long, acuminate, mucronulate, the sinus truncate, often with a small intermediate lobe present), rounded at base, 3-nerved, membranous, glabrous, dark green, usually paler along nerves above, glaucous beneath; peduncles slender, up to 3 cm. long, articulate just below apex; bracts setaceous, 2 to 4 mm. long, borne above middle of peduncle; flowers 3 to 3.5 cm. wide; sepals oblong-lanceolate, 1.2 to 1.5 cm. long, about 0.4 cm. wide, obtuse; petals spatulate, 6 to 7 mm. long, about 3 mm. wide, obtuse, reticulate-veined toward apex, white, the veins darker; corona filaments in two series, filiform, the outer 6 to 7 mm. long, the inner 4 to 5 mm. long; operculum slightly plicate, the margin minutely fimbriate; nectar ring annular; limen cushion-like, closely surrounding the base of gynophore; gynophore very slender; ovary ovoid, glabrous.

Type in the U. S. National Herbarium, collected on Sotar Volcano, near Popayn, Department El Cauca, Colombia, altitude 2,400 to 2,900 meters, March 3, 1884, by F. C. Lehmann (no. 3731).

This specimen is cited by Masters as *P. chelidonea* Mast. in a report of Lehmann's Passifloraceae,² and is the original of a detailed drawing of "*P. chelidonea*."³ The thinner, more deeply lobed leaves, glaucous beneath, the longer peduncles, more slender corona filaments, the two series of which are of nearly equal length, and the smaller flowers distinguish *P. popayanensis* from *P. chelidonea*. The ovary is glabrous, that of *P. chelidonea* densely puberulent.

***Passiflora lyra* Planch. & Linden, sp. nov.**

Stem sharply angular, puberulent; stipules setaceous, 5 to 10 mm. long, deciduous; petioles stout, up to 2.5 cm. long, glandless; leaves ovate-lanceolate, 8 to 12 cm. long, 5 to 8 cm. wide, narrowed near the truncate apex, shallowly 2 (or obscurely 3)-lobed (lobes less than 1 cm. long, acute), rounded at base, subcoriaceous, shining and very dark green and finely and sparsely puberulent above, reddish and densely and softly tomentulous beneath, bearing two conspicuous, white, sub-crustaceous glands in the angles of the nerves; flowers white, about 4 cm. wide, on axillary branches up to 10 cm. long which bear much reduced leaves; bracts setaceous, about 5 mm. long; sepals lanceolate, about 1.5 cm. long, 0.5 cm. wide, acutish; petals linear, about 5 mm. long, 2 mm. wide, very slender; corona filaments in two series, the outer filiform, 4 to 5 mm. long, slightly torulose, the inner capillary, 2 mm. long, capitellate; operculum membranous, slightly plicate, erect, irregularly lacerate to middle, about 2 mm. high; limen annular; ovary ovoid, densely brown-pilose.

² Bot. Jahrb. Engler 8: 218. 1887.

³ HARMS in Engl. & Prantl Nat. Pflanzenfam. Aufl. 2, 21: 499, f. 230, C, D. 1925.

Type in the herbarium of the Muséum d'Histoire Naturelle, Paris, collected at Cumbre de Valencia, State of Carabobo, Venezuela, May, 1846, by Funck and Schlim (no. 552).

The leaves of this species are much like those of typical forms of *P. chelidonea* in general outline, though much less deeply lobed. The dense indument on the ovary and under surface of the leaves and the position of the flowers on short axillary branches are the most obvious characters by which *P. lyra* may be distinguished from *P. chelidonea*.

Passiflora smithii Killip, sp. nov.

Plant glabrous throughout; stem terete; stipules semi-ovate or subreniform, 2.5 to 3.5 cm. long, 1 to 1.5 cm. wide, aristulate at apex, rounded at base, coriaceous; petioles 2.5 to 4 cm. long, 2- to 4-glandular near middle, the glands 0.5 mm. long; leaves 8 to 12 cm. long, 10 to 15 cm. wide, 3-lobed about three-quarters their length (lobes oblong or elliptic-oblong, 2.5 to 3 cm. wide, narrowed to an obtuse apex, minutely glandular-serrulate in the rounded sinuses), subtruncate or cordulate at base, 5-nerved, strongly reticulate-veined, coriaceous or subcoriaceous; peduncles 6 to 7 cm. long, slender; bracts narrowly lanceolate, 6 to 8 mm. long, 2 to 3 mm. wide, acuminate, sessile, deciduous, borne at separate points near middle of peduncle; flowers about 5 cm. wide; calyx tube broadly campanulate, about 5 mm. long, 10 mm. wide; sepals oblong, about 2 cm. long, 0.7 cm. wide, obtuse, slightly cucullate, minutely awned dorsally (awn about 1 mm. long); petals linear-oblong, about 1 cm. long, 0.4 cm. wide, obtuse; corona filaments in several series, the outermost narrowly liguliform, 0.8 to 1 cm. long, the succeeding 3 or 4 series filiform, about 2 mm. long, minutely capitate; operculum membranous, about 7 mm. high, closely plicate, lacerate-cleft to below middle; nectar ring annular, obscure; limen about 4 mm. high, closely surrounding base of gynophore, irregularly denticulate; ovary ovoid, glabrous; fruit ovoid, about 6 cm. long, 3 to 3.5 cm. in diameter; seeds oblong, about 6 mm. long, reticulate.

Type in the U. S. National Herbarium, no. 1,350,965, collected on northern slope of Mesa de los Santos, Department Santander, Colombia, altitude 1200 meters, December 11, 1926, by E. P. Killip and Albert C. Smith (no. 15015).

Additional specimen examined: COLOMBIA: Department Cundinamarca, Tequendama Falls, 1,000 meters, *Triana* 2947, in part (British Museum).

The tendency among students of *Passiflora* has been to place in the subgenus *Granadilla* all species with large involucreal bracts and a complicated coronal structure, subdividing *Granadilla* on the basis of the leaf shape, stipules, and other vegetative characters, thus failing to bring together species that evidently are closely related in flower structure. Harms has suggested⁴ a more logical treatment in his recent revision of the family, although he here considers only a part of the described species. *Passiflora kermesina* Link & Otto (*P. raddiana* DC.) he places by itself in a separate series (no. 2) of *Granadilla*, characterized by small bracts and a plicate filamentose operculum.

⁴ Engl. & Prantl Nat. Pflanzenfam. Aufl. 2, 21: 502-504. 1925.

To this series should be referred *P. miersii*, *P. lehmannii*, *P. trisulca*, *P. watsoniana*, *P. eggersii*, and *P. smithii*. From *P. trisulca*, with which it appears to be most closely related, the proposed species differs in less deeply lobed leaves which have obtuse apices, and in the shape of the petiolar glands.

Apparently two species are represented by Triana's 2947. The plant at Geneva is *P. subpeltata* Ort. (*P. alba* Link & Otto), but the plant at the British Museum is distinct. Triana and Planchon cited no. 2947 as *P. stipulata* (*P. subpeltata*, not *P. stipulata* Aubl.). Triana's 2946, seen at Paris and in the British Museum is also *P. subpeltata*.

***Passiflora cuzcoensis* Killip, sp. nov.**

Plant glabrous throughout; stem terete, or the younger portions subangulate; stipules semi-oblong, 2 to 2.5 cm. long, 0.7 to 0.9 cm. wide, acutish at apex, rounded at base, obscurely crenulate; petioles 2 to 3 cm. long, slender, biglandular in upper third, the glands minute, subulate, 0.5 to 0.8 mm. long; leaves suborbicular in general outline, 3-lobed at apex, 5 to 7 cm. along midnerve, 4 to 6 cm. along lateral nerves (lobes rounded, minutely mucronulate the middle lobe 2 to 3 cm. wide), rounded or subtruncate at base, entire, 5 (or obscurely 7)-nerved, membranous; peduncles slender, 3 to 3.5 cm. long; bracts 3, subimbricate, unequal (one larger than the others), cordate, 2.5 to 3 cm. long, 2 to 2.5 cm. wide, obtuse, crenate-serrulate toward apex, persistent; flowers about 5 cm. wide; calyx tube campanulate; sepals lance-oblong, about 2 cm. long, 1 cm. wide, obtuse, awned dorsally just below apex, the awn foliaceous, up to 5 mm. long; petals lance-oblong, about 1.5 cm. long, 0.8 cm. wide, obtuse; corona filaments in two series, the outer radiate, about 2 cm. long, very slender, apparently concolorous, the inner (borne about 2 mm. from the outer), filiform, 1.5 to 2 mm. long; operculum membranous, about 2 mm. high, denticulate, bearing on outside just below margin a row of very slender filaments about 1 mm. long; limen cupuliform, closely surrounding base of gynophore; ovary not seen.

Type in the U. S. National Herbarium, no. 1,442,740, collected in Marcapata Valley, near Chilechile, Province Guispicanchi, Department Cuzco, Peru, February 21, 1929, by A. Weberbauer (no. 7872).

The unusual arrangement of the bracts indicates the relationship of this species to *P. tetraden*, which it resembles also in the outline of the leaves. The flowers of the two species differ in several details: In *P. cuzcoensis* the sepals are awned, in *P. tetraden* they are without awns, apparently an important difference in the subgenus *Granadilla* to which both belong; the principal or radiate corona filaments are in a single series and concolorous in *P. cuzcoensis*, in two series and alternately banded with blue and white in *P. tetraden*; the inner corona consists of short filaments in *P. cuzcoensis*, of mere tubercles in *P. tetraden*.

***Passiflora spectabilis* Killip, sp. nov.**

Herbaceous vine, glabrous throughout; stem terete, the younger portions subangular; stipules semi-ovate or semi-oblong, 2 to 6 cm. long, 0.8 to 4 cm. wide, obtuse and mucronulate at apex (mucrone up to 1.5 mm. long), rounded at base, entire or undulate, the midnerve eccentric; petioles 3 to 8 cm. long,